A characteristic of rheumatoid arthritis is the presence in the blood and in synovial fluid of a reactive group of proteins called rheumatoid factor(s). These are macroglobulins having a molecular weight of 1 million. In the opinion of many investigators, the rheumatoid factors are antibodies directed against "altered" human gamma globulins. The rheumatoid factors are found in 70-100% of cases of rheumatoid arthritis. They are also present in osteoarthritis, rheumatic fever, and other nonrheumatic diseases such as pulmonary tuberculosis, bacterial endocarditis, and syphilis. A significant incidence of RF in the aged has also been observed.

Since the discovery of RF, there have been many techniques developed to identify and quantitate these factors. The most general useful techniques have been agglutination procedures employing polystyrene particles coated with a layer of human gamma globulin. The RF present in a test serum reacts with the coating material, resulting in a visible agglutination of the latex particles. In the presence of rheumatoid factor positive antiserum, this latex globulin RF reagent can be used to demonstrate agglutination both qualitatively and semi-quantitatively.

The principle of the test is an immunologic reaction between the rheumatoid factor (RF), a micromolecular globulin found in serum, and the corresponding IgG coated onto finely dispersed polystyrene latex particles.

**REAGENTS**

1. RF Latex Reagent. A suspension of polystyrene latex particles in glycine buffer, pH 6.6 ±0.2. The latex particles are coated with human IgG.
2. Glycine-Saline Buffer (20x) concentrate pH 8.4 ± 0.2 is to be diluted 1:20 with distilled water and used to make a serum dilution for the semi-quantitative assay.
3. Positive Control Serum. A stabilized human serum containing rheumatoid factor (RF), a micromolecular globulin found in serum, and the corresponding IgG coated onto finely dispersed polystyrene latex particles.
4. Negative Control Serum. Serum to be titrated is serially diluted 1:4, 1:8, 1:16, 1:32 in glycine buffer, pH 8.4 ± 0.2. The latex particles are coated with human IgG.
5. The reaction of the test serum is compared to the Positive and Negative controls.

**RESULTS**

An agglutination of the latex particles suspension is a positive result. A weakly reactive serum produces a very fine granulation or partial clumping. The results should be read at one minute because non-specific reactions may occur after this period. Sera that are positive in the screening test should be tested in the titration test to provide verification for borderline interpretations.

**SUMMARY AND EXPLANATION**

Rheumatoid arthritis is a chronic systemic disease of unknown etiology frequently characterized by swelling and pain in the joints and by inflammatory and degenerative processes. Rheumatoid arthritis is widespread in the United States and throughout the world and is found in all age groups. Most typically, its onset is in young adults in their thirties and forties. While no specific cure has yet been found, early therapy is of great value in halting or minimizing irreversible damage to the joints.

For this reason prompt diagnosis is of great importance.

**REFERENCES**


**LIMITATIONS OF THE PROCEDURE**

1. RF Latex Test set should not be used if the testing is delayed, specimens should be refrigerated or frozen where applicable.

2. Serum is the specimen of choice. Plasma should not be used.

3. The slide method provides a quick screening procedure, while the tube dilutions may be more valuable clinically since it has the ability to provide quantitative information.

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**REFERENCES**


**PERFORMANCE CHARACTERISTICS**

The clinical significance of RF determination consist in differentiating between rheumatoid arthritis in which the RF has been demonstrated in the serum of approximately 80% of the cases examined and rheumatic fever in which the RF is almost always absent. The RF is more frequently positive in active process of greater duration than in diseases which are less active or are still in early stages.

It is occasionally found in the serum of patients with polyarthritides nodosae, systemic lupus erythematosus and a variety of chronic inflammatory illnesses such as tuberculosis, leprosy, syphilis and bacterial endocarditis. Sera tested from these related diseases showed positive reactions in approximately 6% of tested cases.

Approximately 3.5% of known rheumatoid patients do not react in the screening test. On the other hand, 2% of sera apparently healthy individuals gave RF reaction.